The new economy, a European perspective

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The New Economy: A European Perspective

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1.1. Introduction

The last decade of this century and millennium—and if we are to believe historians reminiscent of earlier *fin de siècle* periods (Landes 1998)—has been a period of major structural transformations at the world level.[1] One witnessed the collapse of the former communist countries and the opening up to market-led economic incentives, with of course as the most extreme case of economic and political integration German unification; the rapid worldwide liberalization of financial capital markets; the further move to the European single market in other, non-manufacturing utilities and service sectors with deregulation of many, traditionally closed, domestic markets; the macroeconomic convergence to a monetary union with the formal introduction of the euro on 1 January 1999; and last but not least, the continuous dramatic reduction in the costs of information and communication processing, opening up an increasing number of sectors to international trade and restructuring. This has been a worldwide structural transformation process involving, however, some regions or areas much more than others. Europe has undoubtedly been at the centre of many of these structural transformations, yet in many ways, it seems to have benefited (as yet) least from the growth incentives behind these structural transformation processes.

While the impact of opening up to global international restructuring may still be in its infancy and take off only in the next century, it has rapidly brought to the forefront how degrees of freedom of national policy actions have shrunk dramatically in a wide variety of different fields. This holds not only for traditional macroeconomic policy but increasingly also for tax, social security, and other policies traditionally preserved at the national level. Among many policy makers and economic commentators these structural transformations and the widely different impact they seem to have on the economic performance of individual countries or regions in the world—an

[1] This chapter is based on research carried out within the framework of the TSER project 'Technology, economic integration and specialization' to be published in a forthcoming book *Europe and the New Economy* by Pascal Petit and Luc Soete. I am particularly grateful to Daniele Archibugi and Bengt-Åke Lundvall for critical comment on a previous draft and to Pascal Petit for the part of this chapter based an common work.

acceleration in growth in the US, a deceleration of growth in Asia—have become part of a wider debate whether one is not confronted with a '*new economy*': an economy much more dominated by global influences and by the speed often in real time of information and communication across distance. Over the last decade the term 'new economy' became particularly popular in the US in a growing number of business and policy circles. In its (17) November 1997 issue, *Business Week* heralded the emergence in the US of such a new economy spurred by two new trends: globalization of business spurred by worldwide freer trade and deregulation, and widespread use of new information and communication technologies leading to a digitization as it was called of all information, leading to new companies and new industries. More recently, the same *Business Week* (24 August 1998) devoted in the midst of the August 1998 financial turmoil a special issue to this new, '21st century' economy with, as subtitle, 'Volatility is here to stay, but technology and globalisation will spur robust growth'. Most remarkably, it did so in the midst of what many predicted would become the rapid end of the longest US growth cycle of the post-war period. It did this also despite growing dismissing views of some of the most established economic policy writers in the field.[2]

In this chapter the account of the emergence of this 'new economy' is based on research carried out within the framework of the TSER project 'Technology and Employment'.[3] 'New' is of course a highly subjective concept. In a first section we review, albeit briefly, some aggregate economic evidence. The latter, because of its aggregate nature, remains of course obscured by many other trends and features. Nevertheless the divergence in growth pattern between the US and Europe and Japan over the last decade is remarkable. In a second section we then review some of the main new economy features as identified by *Business Week*: globalization and digitization. In a first sub-section some of the main features of globalization in terms of trade and foreign direct investment are discussed. Given the fact that these are the subject of some of the other chapters of this book, our analysis remains brief. Nevertheless, the new intangible features of international transactions appear to form the essence of what the 'new' economy is all about. Their expansion contributes to forge what can be qualified as a *new* dimension of globalization, spurred by the particular role of new information and communication technologies (ICTs). From this perspective, ICTs represent indeed the first 'global' technological transformation with

[2] In the meantime, the US economy has continued in 1997, 1998, and 1999, more or less unaffected, its remarkable 'new' long-term growth path. Its unemployment rate has further dropped to levels considered by most academic economists in 1997 to be unsustainable and inflation has reached a historic low; all this despite continuous warnings of a coming stock market and financial crash given the structural low US savings rate, rising medical costs, major consumer defaults following the stock market fall in the autumn of 1998, and increasing wage inflation.

[3] The interested reader is referred to a number of mimeo papers and articles published over the last two years (Petit and Soete, 1997, 1998, and 2000).

which our societies have been confronted. Their impact on the increased international tradeability of many service activities is an illustration of such global impact. In the third section, we briefly discuss the challenges such a more open, immaterial economy in which value generation is less related to material production than to information content, distribution, and consumer interaction poses for traditional economic concepts and in particular the functioning of markets. We conclude by drawing some policy conclusions. In emphasizing the US's growth performance we do not make any assessment of the various distributional problems with which the US economy has been confronted. Nor do we make any evaluation of the long-term sustainability of this growth path given the specific shortcomings of the US secondary education system.

1.2. A 'New Economy' Growth Divergence in the 1990s?

We start the analysis with a rough and brief statistical parenthesis based on Hollanders, Soete, and ter Weel, 1999. Post-war economic growth among the developed OECD countries has been characterized by growth convergence. Countries furthest removed from income levels of the US in the 1950s appear to have witnessed the most rapid subsequent growth performance.

Figure 1.1 shows the relative growth performance, i.e. growth of per capita GDP, of a sample of OECD countries relative to the US. On the horizontal axis one finds the relative distance of each country in terms of GDP per capita to the US level at the beginning of each period. On the vertical axis is the growth rate in GDP per capita compared to the US. Dots above the nil line imply catching up; below falling behind.

As shown by Figure 1.1, there has been a major shift from a general trend of catching-up to the US to a trend of the US increasing its lead in the most recent period 1991–8. The most recent period shows the EU as a group and Japan rapidly falling behind the US.

By contrast the period up to 1973 can be characterized as a period of rapid growth, particularly in the industrialized countries. From a more qualitative point of view this is indeed what appears to have occurred. It was a period dominated by catching-up phenomena: catching-up of European consumption patterns to US standards; significant growth in the centrally planned economies based on further exploitation of Tayloristic methods of labour organization in agriculture and the heavy industrial sectors,[4] and the end of the decolonization process in most Third World countries. It was in the logic itself of such a growth process that the gap between the US and these countries was to narrow down. By contrast, the US economy did, if

[4] The impulse to growth under communism would become based on the electricity revolution and the scientific Tayloristic division of labour organization.

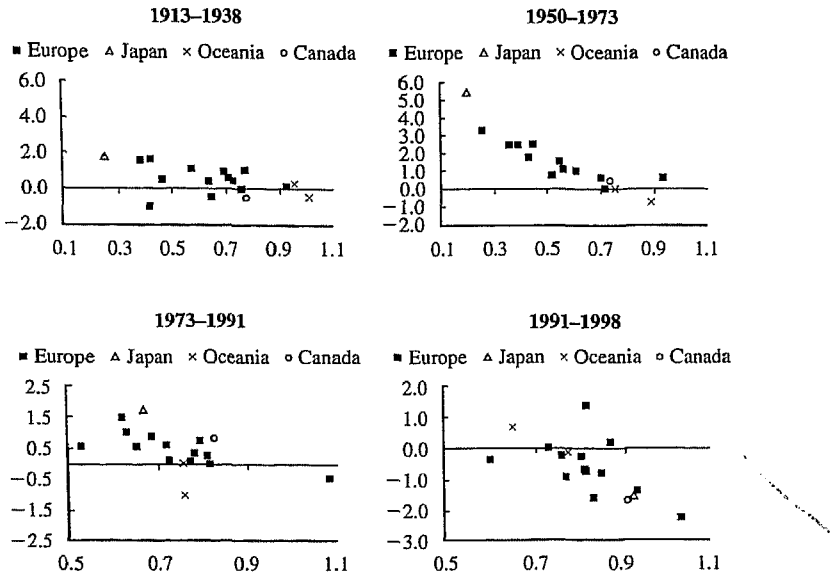

FIG 1.1. *Convergence and divergence relative to the US—growth of per capita GDP*
Source: Hollanders, Soete, and ter Weel 1999.

anything, show some major weaknesses, for example in relation to employment creation.[5]

By contrast, the period 1973–91 appears to be characterized by the disappearance of such strong catching-up features at least with respect to the European developed OECD world and Japan. This happened despite accelerated European economic integration with the subsequent enlargements of the European Community and the move from a customs union to an economic union. It also took place despite the gradual liberalization of financial markets. In fact the period was characterized first by a dramatic explosion of exchange rate volatility, inflation, unemployment, and public deficits. The failure of macroeconomic policies to contain inflation, reduce unemployment particularly in Europe, and control public spending are from this perspective both consequence and cause of the halt of growth convergence and what marked the end of what European economists referred to as *les trentes glorieuses*: the thirty wonder years of high growth, low inflation, and low unemployment.

The most recent period, from 1991 until 1998, appears to be characterized mainly by growth divergence between the US, Europe, and Japan; effectively a leap forward by the US. Once again, this US growth divergence took place

[5] See e.g. the various contributions to the so-called automation debate (US National Commission on Technology, Automation, and Economic Progress, 1966).

despite a major convergence in aggregate economic indicators such as inflation, long-term interest rates, and public spending. It is important to resituate in its recent historical context the continuing unexpected nature of this emerging growth divergence. First and foremost, few authors predicted the slowdown of Japanese growth. At the same time, many others predicted rapid growth in Europe because of the internal economic integration deepening process (the 1992 single market) and the expected rapid catching-up of Eastern European countries to EU income and consumption levels. The ultimate paradox of macroeconomic convergence is probably best illustrated by the arrival of the euro on 1 January 1999, accompanied by a significant slowdown of growth across EU member countries, again very much in contrast to expectations and forecasts. However, the collapse of US growth predicted since the mid-1990s as a result of its low savings rate, high trade deficit, and unsustainable growth in stock market prices failed to occur. Hence, growth divergence among the Triad countries has been a dominant feature of the 1990s.

Underlying the growth process over the last ten years, some other, new factors appear to have emerged, particularly in the US. More than any other country in the world, the US economy appears to have benefited from faster application and implementation of new technologies, more rapid uptake of the new so-called information highways infrastructure, and more successful worldwide commercial exploitation of these growth opportunities. In short, the US seems to have been the most successful country in making its transition to a 'new', more knowledge-, and more immaterial-based economy. This is not the place to go into a discussion about the sustainability of such growth divergence process, particularly in view of the open, global financial and information networks. Nevertheless, the process as it appears to have evolved over the last ten years is remarkable and is well worth some further investigation.

Before discussing some of the possible reasons explaining the US's success in entering this 'new' economy, we turn to some of the characteristic features of the new economy, starting with some of the dimensions of this new emerging open, global world economy.

1.3. Features of the New Economy

1.3.1. From Old to 'New' Globalization

As in many other areas of structural change, there is an ongoing debate about the factual evidence surrounding globalization. We do not wish to discuss the issue here in any detail given the fact that another part of this book is devoted to the issue of globalization. Most of the traditional, readily available, evidence focuses on trade and foreign direct investment (FDI) flows. This evidence tends to suggest that there has been little increase in 'globalization'. From a long-term perspective the ratio of exports or imports to GDP, or even

the importance of FDI, is not unprecedented. The period 1870–1913 is often presented as a time of exceptionally rapid international integration (Bairoch and Kozul-Wright 1998), with trade flows that represented even a higher share of GDP in the UK, the Netherlands, or in Japan in 1913. Other critics underline that FDI flows are mainly intra-regional and globalization a process of regional integration (Hirst and Thompson 1996). Globalization is effectively a myth when it is viewed as a deterministic, entirely market-driven process.

However, from a more institutionalist perspective, one may say that globalization has reached an unprecedented phase, even if trade flows are not unprecedented and if FDI flows remain centred among developed economies. The fact that these trade and FDI flows now concern a much larger number of countries would be enough to characterize a new phase in the process of globalization. More important though is to consider the qualitative changes affecting international transactions. The very nature of these transactions and the institutional contexts in which they occur today are illustrative of the reality of a new phase in the globalization process.

Hence, what we would call the 'new' dimension of the process of globalization refers in the first instance to the intangible part in the fabric of international relations and transactions, based primarily on the internationalization of information and knowledge. Being intangible, these transactions no longer only reflect the financial counterpart of the real trade and investment flows but include now a wide variety of transactions some of which do not show up in the balance of payments, some only do so partially in some service transactions (beyond fees and royalties a lot of business and personal services imply some transfer of technology, information, and knowledge) and others are purely involved in financial arbitrage. These international intangible exchanges affect in very different ways the dynamics of trade and FDI flows. The common denominator is the widespread use of information and communication technologies.

Following Petit and Soete (1998), we track this dimension along five lines of development, from purely financial to scientific information flows:

(1) first and foremost, the particular case of finance, the ultimate (intangible) global tradeable good;
(2) second, the far-ranging deregulation move leading not only to the liberalization of trade and investment flows but also to the deregulation of many intermediate services which are central in the organization of markets and transactions;
(3) third, the practice of formalized (and publicly announced) international co-operation and agreements between firms;
(4) fourth, the free exchange of information and knowledge about new products and markets, that is conveyed by academic activities and media;
(5) fifth, the stock of expertise, experiences, and personal networks that have developed over years in the field of international relations and business,

mainly through the activities of internationalized business services but also through personal contact and cultural links.

The *area of finance* has of course always been highly volatile. However, the volume of transactions, fuelled by a large set of instruments and new means of transactions, has reached phenomenal levels. The growth in the 'globalization' of financial flows over the last two decades has been dramatic. Cross-border transactions in bonds and equities have increased in OECD countries over the last fifteen years from 10% of GDP in 1980 to between 150 and 250% of GDP in 1995. At the same time, the worldwide volume of foreign exchange trading has increased to a turnover of more than $1,200 billion a day (cf. Chesnais 1997). These financial flows are in no way compensatory of trade or FDI flows. They outline the development of new activities on money markets or in stock markets located in those financial centres that have been considerably deregulated. This realm of finance, where huge sums can be transferred instantaneously around the world, has of course become very risky. The speculative bubble that has outstretched the growth of some stock markets can blow up. The rush against some currencies, suddenly perceived as weak, can reach dramatic magnitude. Meanwhile after each 'local' alert the world of international finance tends to develop its own prudential rules to avoid a major systemic crisis. Whether the international financial regime, which is building up in this step-wise process, will prevent major chaos, remains a challenge. The question is too broad for existing international institutions like the IMF, while individual countries seem too divided on control issues (such as temporary exchange rate controls, forced deposit with domestic banks of a percentage of incoming funds, or a small flat rate tax on international capital flows to reduce their volatility as proposed by Tobin) to address such a global question.

Global finance also features an interesting, conservative trait: the importance retained by traditional financial areas such as London and New York. Despite the existence of new means of transacting, other financial areas have remained secondary, with the notable exception of Tokyo. Markets in Frankfurt or Paris find it difficult to remain competitive (even when new opportunities arise, such as EMU and more recently the euro). As for emerging markets that have developed in South East Asia in the trail of their economic upheaval, the financial crisis initiated in the summer of 1997 revealed their intrinsic weaknesses. Indeed the large development of the transactions led to the emergence of new locations and to the development of mid-ranking locations, but overall the hierarchy between financial areas has been more comforted than eroded in the last decade. This 'agglomeration' effect is also telling of the tacit knowledge, which, among other local conditions, is required to be durably successful at a worldwide level, a point that will be discussed below.

The *deregulation move* clearly gained some momentum in the late 1970s with the break up of the stringent regulatory frameworks that had been set up for most intermediary services (banking, transport, communication) in the late 1930s or in the post-war period. The trend to liberalize trade and investment started much earlier—it dates back to the post-war period, when some large international institutions like the GATT, the IMF, or the OECD were specially created to promote the idea of free trade and investment. This trend gained new momentum over the last two decades with, on the one side, the development of regional agreements and on the other side a more widespread and intensive adhesion of developing economies, whether forced by international money lenders to liberalize or induced by a new domestic balance of political power in favour of free markets.

While this trend accompanied the growth in trade and investment flows over the post-war period, the deregulation of intermediate services had its own impact on international restructuring. Deregulation is, in the first place, largely a consequence of the diffusion of new ICTs, which, in easing international access and provision, helped firms to bypass the limitations set by the old national regulatory frameworks. Deregulation forced at national levels has also been pushed forward and co-ordinated within regional agreements. Moreover, innovations in processes and products brought about in this new context stirred the interest for these services and increased the stakes of their restructuring. The privatization that often followed deregulation opened the doors to foreign multinational firms. But it also strongly induced the old monopolies to develop some global reach, in particular, by taking advantage of newly opened markets in developing countries. This all led, in some cases at least, to the creation of large international conglomerates or networks of allied multinational firms. A clear example is given in the telecommunications area, with British, French, and Deutsche Telecoms as major protagonists world wide, while deregulation of telecommunication industries was only just completed in January 1998. But large alliances of multinational firms have also recently developed in banking, insurance, and transport. This does not imply that the phase of liberalization is completed. In some developing countries the process is only starting; its pace, regarding external relations or domestic activities, depends on the outcomes of its policies, on the economic successes and financial difficulties of countries. Furthermore, invisible barriers to trade in advanced countries may be all the more lasting as product markets have become more complex, more differentiated. Some also argue that the liberalization of trade and investment around the world owes much of its dynamics in the past decades to regional agreements that will lock in the process of liberalization. This conflict between 'regionalization' and 'globalization' is either praised or blamed as promoting or hampering what the authors view as the final stage of the globalization process.

The third line of development to be considered is *the development of co-operation between firms* at an international level. We already alluded to this

question when evoking the liberalization of intermediary service industries. Co-operation among firms at the international level (60% of inter-firm technical agreements are international) concerns all industries, even if they tend to concentrate in the high-tech sectors. This constitutes an important change, especially since these accords are public and publicized (the available databases have gathered information on the publicized accords only and they are likely to represent the tip of the iceberg—see Hagedoorn 1996) and because they structure the development of key innovative industries (ICTs and pharmaceuticals) at international levels (quite often beyond the regional level). These agreements have different objectives (production: 25%, R&D: 31%, marketing: 13%, mix of objectives: 30%. See OECD 1994, table 17). Their motivations are diverse. Sometimes firms are motivated to share high investment cost, or to avoid destructive competition; often they try to preserve some flexibility in the capacity of firms to adjust to external changes. Some alliances may appear contradictory, implying that they may be short in their duration. These agreements may last for different spans of time. They may also become obsolete before their term, they may fail or be successfully achieved and renewed. This whole fabric, with its history of past collaborations, sometimes more informal than others, can also take various legal and contractual forms (from joint venture and investment to loose agreements to share information), including arrangements between small firms and large firms as in franchising and the like. If one takes into account this diversity, then co-operation at the international level has been increasing over the past decades, even more intensively than it has domestically, precisely because it aimed to cope with the handicaps met by firms that want to produce abroad or access new markets (see Mytelka's chapter in this volume).

This process of co-operation is creating complex overlapping networks that continuously shape the fabric of global markets and internationalized production processes. Some of these networks may be regional (European, for instance). Most of such accords and alliances, however, are transcontinental and comprise, in various combinations, firms of the Triad (Europe, North America, and South East Asia) which directly transfer for a good deal of them into some FDI flows. Again it shows a meaningful level of global operations and strategies without implying that all international agreements between firms are global in their scope. Still it may be difficult to assess where we stand. Is there room for the development of such agreements? How do they impinge upon the dynamics of production processes and markets? How do they in particular relate to trade and FDI flows? Are they substitutes or preconditions (and therefore complementary)? So far this web of firms' arrangements is not integrated in a comprehensive way in our understanding of the working of our economies, although these arrangements are important, and being public, are also signals to the financial world, to competitors and to governments. They contribute to the process of globalization and are also linked to the treatment of information and knowledge that constitutes

the third perspective we take on the intangible infrastructure backing the process of globalization.

The fourth line of the argument considers *the diffusion of information and knowledge by all the academic activities (scientific meetings and publications) and the media* (the press, general or specialized, as well as TV, radio, and the like). Universities and public research centres are considered as a pre-eminent vector in the globalization of innovation (cf. the taxonomy of Archibugi and Michie 1995, and Archibugi and Iammarino, in this volume). Even if indicators are still scarce, they do show a rise in international co-operation between academics and other public researchers. The ratio of internationally co-authored scientific papers (if compared with all co-authored scientific papers) has reached around 25% in the US and in Japan, and as much as 50% in Europe and the number of foreign students in postgraduate studies is approximately 24% in the US in 1994 (see Archibugi and Michie 1997).

The media are also an important international vector of information and knowledge, through not only the new global reach of TV, but also through the expansion of the technical press and professional international events (from traditional fairs to more professional seminars). The convergence between computing and telecommunication technologies broadens the scope for such international interactions among academics or professionals. In effect the potential of the new ICTs has become a key element in the diffusion of information and knowledge. The Internet in this respect is simply the latest stage of this process of free dissemination, with the worldwide web, which is telling on the globalization process as it develops itself in strong correlation with the levels of development of countries but also with a lot of countries lagging behind or forging ahead of this general trend.

The interesting thing is that information and knowledge are basically freely accessible (even if media are not free, they can provide specific information of high value for those who know how to exploit it, regardless of how information is priced, be it professional journals or more general press diffusing crucial information). Why is something that is costly to produce freely disseminated worldwide? We have a number of good reasons from which to choose. Traditions in academic spheres call for the publication and discussion of information within the scientific community. This is increasingly true as borders are disappearing through the use of English within the international community as a common language. Dissemination can also help to set standards, whether in science or in industry (one present reason is to set the norms of the new ICTs). Free dissemination also favours co-operation, not only around norms but also around projects, therefore avoiding duplications or incompatible varieties of new products. It may be intended for a small community of firms or professionals but at the cost of free riding by others, if they have the relevant knowledge that gives its price to the information under view. There is also the idea of reciprocity in a highly innovative world—where diffusing information may help the innovator to stay abreast of

the next wave of innovations. Whatever the combination of reasons, a mass of information has been made available throughout the world: it can be both reached and used. The potential to access and use information depends on some knowledge which itself has to be built up. The development of higher education and of public research has helped strongly to reduce barriers. ICTs and regional arrangements have significantly contributed to the internal dissemination of information and knowledge. The codification of information that ICTs require has certainly facilitated this international dissemination. However, it is not a substitute for the tacit knowledge that is required in modern industries.

Again, one may question the extent to which the development of some internationalization of academic research and specialized media has contributed to the process of globalization. It is always difficult to appreciate the meaningfulness of some evolution when the laws of the underlying dynamics remain even sketchier. Somehow this discussion parallels the one on the effects that a globalization process could have on the systems of innovation that have been established as being strongly national specific in a recent past.

A strong argument stressing the limits of a globalization process has been to point out that R&D activities of multinational firms have been, until the late 1980s, for the most part realized in their home country (Patel and Pavitt 1991). First, R&D activities are at the core of the activities identifying a firm. Therefore any externalization of R&D activities, even partial, any 'delocalization' to affiliates, or any collaboration with competitors may be surprising. The level at which one should consider it as a critical change is difficult to assess.[6] Second, the economics of R&D is complex, and much of the international relations viewed above (the nexus of inter-firm agreements on technological issues or the transfers of information and knowledge through the networks of academics, researchers, and professionals) are major inputs in this process. Therefore one should be cautious in assessing the impact on national systems of innovations, and all the more so as the forms of competition have evolved on the highly differentiated markets that we featured in section 1.1. Such is the strain put on some systems of innovation that significant adjustments imply that some forms of internationalization are taking place which are becoming more obvious in the 1990s. Thus R&D expenditures by foreign affiliates in OECD countries in 1994 range from 2% (in Japan) to 68% (in Ireland) of total R&D, with significant figures in the UK (35%), in Germany (17%), and in France (15%) (Hatzichronoglou 1998). Although this is not even close to a complete globalization of R&D, it is already a distinct new system, with new external links, that are again very much country specific (see Patel and Pavitt 1999;

[6] Philips, the large Dutch multinational, realizes 40% of its R&D abroad, which may be considered as high or low accordingly. It should also be taken into account that R&D expenditures mix research and development activities which can be externalized and internationalized, both of them on very different grounds according to the sector, whether it is pharmaceutical, for instance, or automobile industry.

Cantwell and Janne 2000). The question therefore is: how will such a trend develop? Will there be hierarchies among clubs (or networks) of multinational firms of various countries within industries? Or will there be means for national systems to adjust to new norms of competition? Much depends on the abilities of countries to recreate the structural bases of idiosyncratic dynamics.

The fifth line of the argument focusing on the intangible logistics supporting the globalization process underlines the role of *a comprehensive group of professionals* setting the norms of international transactions. The core of this group is composed of professionals working in business and financial services. They may not be directly involved in the international transactions that are part of the expanding trade in services. Still their work is directly concerned with the organization and supervision of international operations. Norms, rules, ethics are set by their own experiences.

One example is professionals managing pension funds. The criteria on which they manage their internationalized portfolios are crucial. They may use the information and knowledge that academics and the media diffuse, but mainly as inputs to help form their own opinions (which certainly have irrational and speculative aspects). Beyond this highly publicized example one finds a complex set of experts and special authorities, operating in insurance, law, finance, and accountancy. Just to illustrate their hold on businesses world wide one may recall (following Strange 1996) that the big six accountancy firms (Price Waterhouse, Peat Marwick, McClintock, Coopers & Lybrand, Ernst and Young, Deloitte Touche Tohmatsu, and Arthur Andersen) audit 494 of the Fortune 500 and that their worldwide fees total $30 billion (the GDP of Ireland). Their norms (rather inspired by US practices) tend to be imposed universally, especially through the symbiotic relationships that these accountancy firms have developed with banks and financial institutions. Such networking by international professionals or experts concerns a range of activities that goes beyond the ones we just mentioned, as it includes real estate (a high component of FDI), leisure (from international sport organizations to amusement parks), and cultural industries (with the technological convergence between computer and telecommunications technologies broadening the scope for worldwide markets of mass media products).

This last perspective shows how deeply rooted the changes in organizations and practices are that build up the kind of global reach suggesting the international involvement of so many economic agents. On one side, it clearly shows that decisive moves within one country may follow from changes that occurred abroad, for example in norms, ethics, or knowledge, without the occurrence of any international transactions that could have been registered by the balance of payments. On the other side, it shows that this global interdependence does not display a clear ordering principle, neither a clear law of market competition nor a clear hegemonic power of one nation state.

Although we did not discuss this last issue, we return to it in assessing the room for manoeuvring left to the nation states. At this stage we have recalled

the complexity of markets, with their high product differentiation and the segmented structure of countries' roles. We have then stressed above, with this third dimension of globalization, by which concrete means an accumulated base of information and knowledge has developed to support global strategies of economic agents, be they firms or individuals. Before we investigate the implications of this new context for nation states, it is worth calling specific attention to the one key factor contributing to this change of context, namely the diffusion of the new ICTs.

1.3.2. **Digitization and the Expansion of Markets**

In effect, if the world has entered into something of a new era in which global access has become a major characteristic of both production *and* consumption, then the cluster of new ICTs has been at the centre of this process. The ability they provide dramatically to reduce communication and information handling and processing costs has been the permissive condition for the expansion of the third dimension. This expansion has also forged the lines of development of these new technologies. The trend towards worldwide access is intrinsically linked with the ability of ICTs to codify information and knowledge over both distance and time and this global potential oriented the norms and the codes developed around the ICTs. It does not follow that ICTs have similar impacts on all sectors or on all countries. In some areas, such as finance, which is a major user of ICTs, and where this diffusion has been accompanied by an institutional liberalization and deregulation process, the globalization process has been most rapid: financial capital has in essence become fully internationally mobile.

In traditional manufacturing production, the decline in communication and information costs has further increased the international transparency of markets, reinforcing the scope to choose world wide where to produce and how to sell on different markets. It has also accelerated the rhythm of product innovation.

In areas such as services, new ICTs are often for the first time allowing cheap 'global' access to low-cost labour locations, thus facilitating the relocation of various 'routine' service functions and activities. Basically it also allowed for a much larger product differentiation and for the diffusion of finely discriminating tariffs (opening the way to yield managements). In the field of intermediary services, it enhanced a deregulation trend that deeply transformed these activities. Firms and organizations have come to discover both the benefits of international differences in labour costs in areas and conversely the advantage of the agglomeration of competencies (Freeman and Soete 1994).

It also follows that the benefit did not accrue evenly to all countries. ICTs contribute to global economic transparency in so far as they bring to the forefront the cost advantages as well as the specific competencies of alternative

locations. But this is not a neutral clarification of pre-existing advantages. ICTs create their requirements in terms of individuals' and organizations' abilities or network facilities. Furthermore, if ICTs have positively affected international access to information and 'codified' knowledge (David and Foray 1995), which is useful to organize production processes and to access markets on a worldwide basis, its potential is limited by differences in local capacities to use or have the competency to transform such 'codified' knowledge. In effect the potential for catching up, in terms of competitiveness, based upon the economic transparency of advantages, strictly depends on some 'tacit' knowledge and other competency elements much more difficult to transfer by definition (Foray and Lundvall 1996; OECD 1996). The threat of rigid or widening segmentation it implies is one of the big challenges of this phase of *de facto* globalization, largely borne by the ability to master the ICTs.

There is little doubt that the US has been much more capable of benefiting from the emerging ICTs. There has been a dramatic revival of the US semiconductor industry following the US–Japanese semiconductor trade agreement effectively providing breathing space for such a revival. On the other hand, the alliance between the software and semiconductor industry has allowed for effective commercial exploitation of technological improvements in the computer industry. Authors such as John Zysman refer in this context to the notion of 'wintelism' (Borrus and Zysman 1998): the combination of continuous technological improvements (e.g. Pentium from Intel) in chip performance and operating systems such as windows (from Microsoft) requiring extensive performance capacity. Thanks to the combination of free local telecom access, expertise in hardware and software network technologies going back to DARPA and ATT (e.g. Sun and the software languages UNIX, Java, and now Jini), and the development of a universal Internet Protocol (Netscape), Internet use rose rapidly outside of the traditional scientific community and was quickly taken up by businesses and individuals. Finally, the availability of an extensive content (film, television, radio, press) sector provided a rapid take off in terms of new Internet content services.

The result has been that the US led the world with maybe one or two exceptions (Finland, Sweden), in Internet use and pricing, in number of websites, Information Service Providers, hits, sales on e-commerce, etc. (see also Fagerberg's chapter in this volume). The growth in employment in these ICT-related sectors has been significant and is expected to continue, as has been the volume of international trade generated. The international US competitiveness in these sectors has undoubtedly been greatly enhanced by the sometimes forceful imposition world wide (China) of strong intellectual property regimes (see, for instance, the systematic implementation methods of the Business Software Alliance in individual countries) in the area of copyrights, trademarks, and authorship rights (extended recently from fifty to seventy years).

But the final consumer end of these new ICT-based sectors is of course only one part of the 'new' growth story. Probably even more important has been the impact on firms' internal efficiency, the impact of so-called business-to-business e-commerce (OECD 1998). The increased potential for codification and transferability allowed for by ICT allows indeed also for significant reductions in transaction costs; for a process of 'de-intermediation' and decentralization of activities and more global direct distribution and access (Soete 1998).

The importance of access brings to the forefront the overriding importance of new communication infrastructures, as enabling factor for both cost reduction and the foundation of new markets.

1.4. New Economic Growth and New Market Rules

There is little doubt that one of the main achievements of economics has been the pervasive illustration that prices in well-functioning markets lead both in a static and in a dynamic sense to 'optimal' outcomes. In a static sense, 'free-market' prices solve in a better way than any other system the distribution of scarce commodities between consumers—anyone not willing to pay the market price will simply not be allowed to consume the commodity. In a dynamic sense, prices also signal profit opportunities to potential suppliers, their entry and competition with the incumbent, bringing prices in line with production costs. Under the well-known assumptions of free, well-functioning open markets, such market price systems will create the maximum amount of social surplus. It could be argued from this perspective that the failure of the planned-based, socialist system was in the first instance a failure to cope with the dynamic challenges. It failed to increase social surplus, precisely at a moment (the 1970s and 1980s) when changes in new production methods and new product opportunities were also challenging the capitalist market system.

However, for markets to function well three essential structural conditions need to exist: excludability, rivalry, and transparency. These conditions are to some extent intrinsic to the exchange of material goods.

Thus, the exchange between seller and buyer needs to involve the exclusive exchange of ownership over the particular product. Once traded the latter is no longer the property of the seller but the exclusive property of the buyer. It is this feature which is, of course, behind the notion of economic scarcity and provides the impulse for new output activities on the part of the seller. Another feature typical of material production and open markets is the notion of rivalry. While significant economies of scale are likely to exist in the production of most material goods, the selling of a single good will still imply that the same good cannot be sold to another buyer. At the same time, while there might be significant entry barriers, the threat of new entry will imply

that suppliers will not be in a position to keep prices substantially above costs. Rivalry is in other words a major and essential condition for markets to generate optimal outcomes. Finally, the exchange of material goods involves a high degree of transparency: the buyer can see, feel, test, smell, in some cases even taste, the product on offer.

In the case of the exchange of a pure information 'electronic' good, it can be argued that none of these conditions holds. The owner of the digital commodity selling his product in the market-place will have difficulty in preventing buyers or anyone else for that matter from copying and reselling it. Excludability will typically be difficult if not impossible to achieve. Rather than a purchase and sale relationship, the nature of the exchange will look more like a gift. The creation and enforcement of excludability is hence an absolute and first condition for such markets to exist. Hence the focus on encryption, watermarks, and various other forms of tracing and monitoring property rights is central to most policy documents on e-commerce. Without these rules creating excludability, no optimal level of production can be achieved and little indication can be obtained of the sort of products that are wanted by potential buyers.

Yet the creation and strengthening of such property rules has, of course, immediate implications for the openness and the degree of competition in such markets. If property protection is absolute, whereas at the same time marginal production costs are minimal, possibly even nil as typical for many digital goods, many potential users will not consume, and compared to the social optimum, too little will be produced (as in the case of the virtual monopolist). At the same time, the individual producer is now being guaranteed a fixed property income and has little to fear both from competitors and consumers who can only choose to buy the particular product from him. This non-rivalry characteristic directly challenges the optimal market outcome. It raises a very large set of welfare questions characteristic of what has been called network economics and involving competition policy, regulation—for instance price control in the case of natural monopoly—standards, and interconnectivity, etc.

Finally, despite the tremendous opening up of trading possibilities and the increase in market transparency, the actual exchange of a digital commodity will involve almost by definition a high degree of information asymmetry between seller and buyer. Many of the new forms of markets emerging on the Internet are typical illustrations of such problems of information asymmetry and well known in information economics. New intermediaries emerge assisting buyers in their search; alternatively, goods might be offered free, paid for by advertising or by subsequent upgrades; a limited preview of the good might be offered free; etc. Yet, what is clear is that the traditional physical market-place is being replaced by a far more complex and diversified set of exchange methods in which the value of what the content seller is offering is likely to differ strongly among individual consumers—hence the crucial

importance of so-called versioning (Varian 1997)—and is becoming distributed among many intermediaries that have brought buyer in contact with supplier—with significant shifts in the value chain as highlighted in so-called attention or click economics.

On all three accounts it is difficult simply to subscribe to the notion that the newly created markets will, as in the exchange of physical goods, guarantee optimality. As Bradford de Long and Michael Froomkin (1998) put it forcefully: 'What used to be second-order "externality" corrections to the invisible hand have become first-order phenomena' in the cyberspace world. Nowhere else is this more clearly illustrated than in the artificial creation of excludability. In contrast to the old notion of the invisible hand of the market, excludability is human made. Its length, its height, its breadth as in the case of patent protection is likely to have major implications for market structure, competition, and more generally welfare. Furthermore, while national rules might be enforced and hence domestic excludability succeed in generating an optimal outcome, international differences in the protection of property rights might undermine such domestic attempts at strengthening intellectual property. In other words, the human-made rules of excludability involve practically by definition particular sectoral and/or national lobbies. Excludability is also questioning the traditional arguments about the welfare gains from trade: for example, strengthening the imposition of the international property regime world wide might well shift the terms of trade in favour of countries specialized in digital goods and content at the disadvantage of countries more specialized in manufactured commodities.[7] This may well be one of the underlying 'real' factors behind the Asian crisis.

1.5. New Policy Challenges to the Nation State

In most debates, the globalization process tends to be associated with the end of nation states. One has to take a much more balanced view. Entering a new phase of globalization certainly transforms and alters the power of the old nation states. But an assessment of the new room for policies that nation states have kept or can develop is crucial to reconstruct any active structural policy (see Lundvall and Archibugi and Iammarino, in this volume). The limits set to the power of the old nation states are obvious.

During the past 'fordist' period of rapid growth of the now-developed economies, states and governments have been involved at an unprecedented level in economic activities. Besides the enlargement of public sectors and the enrichment of regulatory frameworks, standard macroeconomic Keynesian

[7] Once again, there is no superior invisible hand in arguing about such a shift. For many centuries, the now-developed countries have freely taken from now less-developed countries their ideas, technologies, and knowledge.

policies, with their monetary and fiscal instruments, played a central role in this monitoring of economies. The new context, providing economic agents more or less directly with some global reach, limits the power and scope of these policies, while favouring a trend of deregulation and of privatization of the public sectors. Even if this statement requires many specifications,[8] it remains that the old tools that allowed individual nation states more or less to successfully monitor their economies have been drastically constrained. While this does not imply that new room for manoeuvre does not exist, it highlights the need for a new policy framework. The new challenge to nation states may be precisely to articulate policy actions at each level which allow them to take mutual and significant advantage of a tamed process of globalization. We briefly present these reasons, starting from a more local level and moving towards a more universal one, concluding with some future perspectives on the EU.

1.5.1. **Around Industrial and Structural Policies**

The first level refers to the change of context for industrial and structural policies induced by the present phase of the globalization process. The structural changes on which we focused, with the development of new forms of competition on products markets and of new relations with multinational firms at local levels, enhanced by the diffusion of new technologies, somehow enlarged the scope for policies taking care of the general environment of economic activities. Industrial and structural policies seemed in that respect to be given a new opportunity, all the more welcome since standard macroeconomic policies had been further constrained in the process. Still at the same time the balance of power between the local, national, and international levels of government has changed. The question is then to reassess, in a schematic way, the perspective left to nation states to develop comprehensive structural policies, e.g. policies that transform the context in which an economy operates. In effect, the economic efficiency and competitiveness of a territory depends greatly on the quality and range of its infrastructure. A good match of a territory's infrastructure with the geographic, historical, and cultural background increases positive external effects, helping to create competitive advantages. The infrastructures under view are mainly of two kinds: those in charge of education and training of the labour force; and those organizing by means of large network services (transport, communications, distribution, finance) all the 'intermediations' implied by the functioning of markets and the running of production processes. A whole economic literature on endogenous growth theory has been pointing at the potential importance of such infrastructure

[8] Thus one should speak of a radical change in the orientations of the regulation frameworks more than of a deregulation trend. It is clear in the case of finance where a deregulation of a regulatory framework which segmented activities tends to favour a more prudential-oriented reconstruction of regulations.

effects. Much emphasis has been put on national levels. Still little is known on the idiosyncratic dimension of this supportive action: how can specific combinations of these factors increase the positive externalities and at which level, local, national, or regional, should they be organized? We stressed above that structural change developed a new relationship between the local and the global level. We also underlined the importance of the regional organization of nation states. Both evolutions affect the primacy that nation states had in the building up of infrastructures. Local authorities will be tempted to favour symbiotic moves adjusting closely infrastructures to local characteristics (searching for new industrial districts or science parks). Regional authorities will, on their side, favour a greater regional harmonization of the infrastructures. Much depends on the type of infrastructure under view. In some cases, as in telecommunications, the deregulation and the regional if not global harmonization of service provisions is well advanced. In the case of education and training the monitoring is still national, with more or less autonomy left to local levels.

Nation states have thus a complex role to play. Regarding logistics, which are basically organized under international regulations, they may help to develop schemes 'downstream', facilitating specific uses of the logistics (aiming at special groups of people or special local regions). As for infrastructures that would be strongly influenced by local needs, nation states may avoid a too stringent specialization and provide schemes allowing some adjustment, as in the case of education, possibilities of mobility, and retraining.

To conclude, the structural changes over the last decades seem to have brought new opportunities for comprehensive industrial policies but nation states cannot straightforwardly make use of these possibilities. They have to take into account the new balance of government between local, national, regional, and global levels. Nation states are thus led to articulate their actions accordingly. This shift still leaves them with a potential of intervention, if they make an adjustment which basically attempts to monitor comprehensive learning processes on how to use the new 'market' logistics, instead of monitoring directly the provision of these services (as was done previously with the 'public' services). They remain key actors, with a unique legitimacy and historically rooted know-how, to launch such schemes at a meaningful scale, even if the complexity of this set of policies strongly limits their political appeal.

1.5.2. **At the Heart of the Working of International Regimes**

Globalization also proceeds through the organization of some sectoral issues at a world level. The notion of international regime precisely considers *per se* the relative autonomy of such international organization with its own rules, historical experiences, and balance of power. The most common example of such international regime has been given by the oil industry.

The political power of nation states is an important factor in establishing the rights and the prices of the exploitation and the distribution of oil. The hierarchy between nation states and the more or less hegemonic power detained by the US, at various periods, contributed to the high specificity of this global market. Financial markets are another example of such international regime, with the role of the nation state being completely different. Localizing market activities around the world, even in fiscal heaven, strongly give the impression of a footloose 'industry'. We have stressed that such was not fully the case, as the core of this activity remained in historically financial places. But even more important is the fact that nation states one way or the other are the only actors likely to prevent the system from running unacceptably high risks and collapsing. It is not at all certain at this stage that states will be able to co-ordinate their actions and avoid such chaos. Still the lessons from the financial crises of the last decades is that beyond the limits of specialized international financial institutions, states' interventions have been rapid and forceful, even if they did not put an end to the financial turmoil. One of the big paradoxes of this financial regime is precisely that without this credo—that states will end up bailing out the bankruptcies—a deep lack of confidence would rapidly bring to an end the expansion of the financial sphere. This importance of nation states, that shows up in the governance structure of such rather accomplished international regimes as the ones we just mentioned is also pointing at the area of intellectual property rights which plays a crucial role in the present forms of competition. In effect these rights condition the existence and duration of nearly all the rents of innovation and therefore of the whole dynamics of non-price competitiveness, which has gained in importance in the last decades. The fact that the most successful firms in the past decades have been selling intangibles (such as Microsoft) strongly illustrates this strategic importance.

The widespread and 'hierarchized' international organization of production processes in key high-tech industries (such as electronics or pharmaceuticals) is based largely on the nexus of national and international laws, private inter-firm agreements, and public co-operation which constitutes the regime of intellectual property rights.[9]

In all the above examples the importance of nation states shows up clearly, but this power is here severely limited by the place of the country for this special activity in the concert of nations. Such a context is often governed by a hegemony, basically the US or a club of countries. It is in such fields that regionalism may lead to construct a more or less asymmetric triadic pattern. Still the disconnected nature of these international regimes, concerned with

[9] The new competition era, qualified of wintelism by Borrus and Zysman (1998), to echo the success of the strategies of Intel and Microsoft to set norms, standards, and pace of technical change in the electronics industry, is obviously strongly conditioned by this regime of intellectual property rights.

different activities, limits the collusion between issues. Thus Europe, where the regional integration process is most advanced, has in effect no common energy policy (but instead a common agriculture policy) and is more a follower than a leader regarding property rights or global financial issues. More generally nation states do not seem to take large initiatives in the ruling of these regimes, being more inclined to follow in each field the hierarchy of power inherited from the post-war period.

1.5.3. **On the Forefront of Really Global Policy Issues**

There are large numbers of issues which are in essence global and require some explicit international co-ordination that no other agents can initiate but nation states or at a broader level regional entities such as the EU. We have already stressed that globalization, as a process induced by market forces, was by no means heading towards some well-ordered world with a desirable or acceptable ranking of priorities. Differences in national trajectories tend to make adjustments more costly and erratic than desired (Boyer and Drache 1996) and the whole market process seems awkwardly short sighted. On two grounds these drawbacks are unbearable and should force countries to co-operate. Nation states or within the boundaries of the EU treaties, the European Commission are the only legitimate actors that can launch the process of co-operation and forge its institutions, taking into account that non-governmental organizations (NGOs) have a limited autonomy and capacity, and act mainly as instigators for the actions of countries. One of these crucial fields is science and technology; the other is the field of environmental threats.

One can easily see their complementarity. Once the complexity of science and technology is taken into account in all its dimensions, the advantages of international interaction, networking, and co-ordination (as is *de facto* taking place in the private sector with respect to privately funded research) of government-sponsored basic and long-term research is an obvious opportunity. When the challenge of environmental threats is at stake, this scientific co-operation on basic science becomes imperative.

These 'global' advantages have been most evident in the case of the so-called 'mega science' research efforts, where a single country or even Triad block such as the EU can no longer cover the full variety and diversity spectrum of scientific disciplines, approaches, and methodologies, let alone the rapidly increasing equipment and material costs of such very costly research. It first raises the question of the responsibility of the richest, most-developed countries for sharing the international burden of such 'big science' research efforts. There are in effect major differences between the OECD countries in the share of GDP devoted to basic research. This global responsibility is even more striking once the 'global' demand side and the truly global environmental problems the world is confronted with are introduced in the analysis

(but also famine, diseases, desertification, energy, etc.). Environmentally sustainable development requires a wide range of complementary policies, if only to support the investment in the new environmental technologies that is needed. International agreements on environmental regulations, probably the most explicit expression of positive integration, do raise formidable policy challenges. No existing international institution can face such challenges of environmental problems of the magnitude we are alluding to. Most of them have been created with a precise mandate and, strangely enough, their room for manoeuvre and their autonomy seem to have reduced while the globalization process was deepening. Only nation states can, up to now, try to coordinate their actions and set up the relevant institutional bodies. However, such co-operation is not an easy task.

Given the international character of environmental problems, the goal of environmentally sustainable development is important to all of the different regions and nations of the world. In practice it requires a widespread diffusion of relevant technologies and supporting institutions. The multinational character of both the problems and the solutions suggests a strong role for new supra-national organizations. At the same time the localized nature of many of the sources of pollution and differences in the institutions and solutions that have developed to solve environmental problems require an extensive involvement at the regional, national, and local levels. All of which calls for the creation, through the co-operation of nation states, of a whole new set of institutions, meeting the criteria of transparency and non-bureaucracy, common in most countries nowadays. Defining and developing a consensus around specific environmental goals is, however, a thorny problem, particularly when environmental goals require substantial changes to systemic and interlocked technologies. Examples of such chains of implications could be drawn from agriculture, with the reduction in the use of some intensive methods or transport; with a reduction in the use of private cars. These types of major changes to the techno-economic system cannot be achieved without political debate. How to achieve such political debate at the global level with the many different interests and trade offs remains largely an open question.

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